

culture results: *Staphylococcus epidermidis* suggested vancomycin. The patient underwent debridement in the operating room. However, the condition did not improve. **Discussion:** This patient experienced sepsis with MDRO. Apart from geriatric age, the patient also has diabetes with complications of kidney failure. This worsens the patient's immune system. So the patient's diabetic ulcers and decubitus ulcers worsened with the results of cultures with various antibiotic-resistant multiorganisms. And also the respiratory infections increase the risk of mortality. **Conclusion:** MDRO is a risk factor for inappropriate antibiotic therapy, which is undoubtedly associated with increased mortality.

Key Words: MDRO; Sepsis; Antibiotics; Mortality

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Routine air sampling and culture in operating room for prevention of surgical site infection

Seon Uk Choi¹, Seo Yeon Lee¹, Ji Yeoung Yim¹, Young Hwa Choi² and Wee Gyo Lee³

¹Infection Control Office Ajou University Hospital, Suwon, Korea, ²Department of Infectious Diseases Ajou University School of Medicine, Suwon, Korea and

³Department of Laboratory Medicine Ajou University School of Medicine, Suwon, Korea

Objective: Open surgical wound is prone to surgical site infection due to contamination of surrounding environment. Therefore, routine air sampling and culture of two operating rooms (OR) was performed from 2018 to 2023 to monitor and evaluate air quality and provide appropriate infection control measures. **Method:** 2 OR regularly performing prosthetic insertion were selected for routine air sampling every 6 months due to high risk of surgical infection associated with the procedure. Air sampling was performed by collecting 1000 litre of air over 10 minutes using air sampler (MAS-100 Eco, Merck). Collected air was cultured on blood agar plate and Sabourand dextrose agar for 30 days, and pathogen identification and quantification was performed upon positive culture result. This study employed a cut-off point of 17.6 colony forming unit (CFU) as specified by federal standards on biological particles published by National Aeronautics and Space Administration. **Results:** 12 air samplings was performed from 2018 to 2023. A single case of positive bacterial air culture was reported (20 CFU, coagulase-negative *Staphylococcus*). Infection control measures were provided upon reporting of positive bacterial air culture, including inspection of positive pressure ventilation system and high efficiency particulate air filter, disinfection of OR and the equipment, and more strict regulation of temperature and humidity. Air sampling was repeated after imposing the measures to evaluate their effectiveness. Cases of surgical site infection caused by the identified pathogen were monitored for 90 days, after which it was determined that there was no surgical site infection related to positive air culture. **Conclusion:** The six-year monitoring of OR air sampling confirmed that detection of positive air culture in routine sampling was not associated with surgical site infection. Based on this result, the hospital decided to conduct air sampling and culture only in outbreak of surgical site infection as part of epidemiologic evaluation.

Key Words: Airborne bacterial count; Air sampling; Operating room

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Enhancing infection control activities through departmental infection control facilitators

Sunhwa Kim

Affiliation including department and/or program: Infection control department of Gangnam severance hospital

Introduction: In the Intensive Care Unit(ICU), healthcare-associated infections can arise from factors such as compromised patient immunity and the use of diverse medical equipment. Furthermore, inadequate awareness of

infection control among ICU staff can further increase the risk of infections. Therefore, it is crucial for ICU staff to recognize and address infection risks proactively. To enhance infection control measures, designated infection control facilitators within the department have spearheaded infection control activities. **Case Presentation:** Internal assessments within the ICU identified areas requiring improvement in infection control, leading to the formulation of a self-improvement initiative. The evaluation results revealed deficiencies in pre-hub disinfection and the appropriateness of Chlorhexidine gluconate(CHG) bathing. To address this, ICU team members were tasked with monitoring hand hygiene and performing pre-hub disinfection at least 10 times before central venous catheter usage. The monitoring results were shared with department members monthly, encouraging performance improvement by rewarding outstanding employees. Additionally, protocols and educational videos for proper CHG bathing were developed within the ICU and reviewed by the Infection Control Department. Using this material, internal education sessions were conducted within the ICU to support all team members in achieving their goals. **Discussion:** Through various improvement initiatives, staff awareness of infection control has increased, leading to proper CHG bathing and hub disinfection. The incidence rate of central venous catheter-related bloodstream infections decreased from 4.25 in 2022 to 3.35 in 2023. Additionally, hand hygiene compliance increased from 92% in 2022 to 96% in 2023. For effective infection management, the participation of not only the Infection Control Department but also departmental members is crucial. Through effective collaboration and discussions between ICU staff and the infection control team, we were able to address departmental issues, improve staff awareness and performance in infection management. Sustained interest and participation in these activities require continuous staffing and support.

Key Words: Healthcare associated infection; Quality improvement; Collaboration; Intensive care unit; central venous catheter

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Smart management of single surgical instruments through unique device identification (UDI) barcode tracking system for enhancing sterilization quality and patient safety

Jr-Huei Liu^{1,2,3,*}, Chu-Ying Wu³, Wei-Ting Liang⁴, Min-Fen Hsu¹ and Chiu-Yu Liu¹

¹Pingtung Veterans General Hospital Nursing Department, ²Meiho University,

³Central Sterile Supply Department and ⁴Operating Room

Introduction: We propose to develop a Unique Device Identification (UDI) barcode tracking system for surgical instruments. This system aims to enhance hospital processes, thereby benefiting both patients and staff members. **Methods:** The UDI barcode tracking system for surgical instruments was implemented in March 2023: 1. Each surgical instrument underwent laser engraving with a UDI barcode, encompassing relevant data such as instrument name, image, model, specifications, origin, license, Instructions for Use (IFU), and total distribution quantity. 2. Upon scanning the engraved serial number, the system automatically discerns whether the instrument belongs to the designated set. 3. Mechanical, chemical, and biological monitoring indicators are integrated into the tracking system, with automatic adjudication for release into storage if criteria are met; otherwise, notifications are issued for review and retrieval by personnel. **Results:** 1. Between March 2023 and February 2024, a total of 157,614 instrument sets were equipped with this system, enabling staff to achieve a zero-error rate in rapid and precise instrument identification. 2. During this period, 4,026 cycles of high-temperature sterilization monitoring and 380 cycles of low-temperature H₂O₂ plasma sterilization monitoring were recorded. 3. Each monitoring cycle was digitally recorded, obviating the necessity for paper-based documentation and saving a total of 4,406 A4 paper sheets. 4. In the same timeframe, a total of 85,899 packages were dispensed, each linked to patient medical record numbers. **Conclusions:** The adoption of the surgical instrument UDI barcode tracking system by our institution's central sterilization supply department has garnered participation from 622 individuals. It not only reduces the time spent by staff searching for items and conducting educational training but also automatically identifies whether the instrument belongs to the package, thereby enhancing inventory efficiency and reducing the

incidence of errors. Sterilization monitoring indicators are automatically uploaded and intercepted to uphold patient safety.

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Healthcare-associated urinary tract infection: epidemiology, burden of disease, and related factors at a teaching hospital in Ho Chi Minh City, Vietnam 2017–2022

Huynh Minh Tuan^{1,2}, Pham Thi Truong Ngan², Nguyen Vu Hoang Yen¹, Trinh Thi Thoa¹, Truong Thi Le Huyen¹, Huynh Hoang Hai¹, Le Thanh Truyen¹, Nguyen Thi Minh Khai¹, Le Thi Yen Nhi¹ and Pham Thi Lan¹

¹University Medical Center, HCM City and ²University of Medicine and Pharmacy at HCM City

Corresponding author : Tuan Huynh MD. PhD. (0909.349.918; huynh.tuan@umc.edu.vn)

Introduction: Urinary tract infection (UTI) is a common healthcare-associated problem. UTI has a lower mortality prevalence than other infections, but it is at high risk of leading to sepsis and increased treatment costs. Therefore, the objective of the study is to describe the epidemiology and burden of disease and determine factors associated with healthcare-associated UTI in the intensive care units (ICUs). **Methods:** A cross-sectional study was conducted on 4,028 patients admitted to the ICU, Neuro Surgical ICU, and ICU - Cardiovascular Surgery Department at a teaching hospital in Ho Chi Minh City from 2017 to 2022. The study collected secondary data through electronic medical records, including age, gender, diagnosis, department, urinary catheter use, urinary catheter retention time, treatment, and urine test results. **Results:** The prevalence of UTI in ICUs was 4.0%, of which CAUTI accounts for the highest prevalence, with the typical pathogen being *E. coli*. The Neuro Surgical ICU had the highest incidence and catheter-used prevalence in ICUs. UTIs were concentrated in people over 80 years old, females, and brain diseases. The length of the hospital stay was long, and the cost of the hospital stay was unaffordable, up to hundreds of millions of VND. The study found factors associated with the prevalence of UTI, such as age, gender, department, diseases, and urinary catheters. Patients with urinary catheters have a 10.98 times higher prevalence of UTI ($p < 0.001$; PR = 10.98, 95% CI 4.87–24.76) compared to patients without urinary catheters. **Conclusions:** The results of the study demonstrated that UTI remains a burden on the healthcare system, especially in ICUs. Implementing a UTI prevention package for patients with catheters is important. Besides, it is necessary to maintain continuous training for healthcare workers to properly and timely insert, remove, and replace catheters.

Keywords: Urinary tract infection; Intensive care unit; Healthcare-associated infection

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The difference in latent tuberculosis prevalence among medical personnel in negative and non-negative pressure TB isolation ward at Kandou General Hospital, Manado

V Darryl, A Nugroho and P Harijanto

Department of Infectious Disease and Tropical Medicine Kandou General Hospital

Background: Negative-pressure isolation room was considered the standard for Tuberculosis (TB) isolation ward, but it tends to be high in cost and maintenance. Alternatively natural ventilation with the combination of mechanical ventilation (exhaust fan) room were more commonly used in resource-limited settings. However, its efficacy to prevent TB to the medical staffs are unknown. **Objective:** To compare the prevalence of latent TB among medical staffs that works in negative-pressure isolation ward against natural ventilation isolation ward at Kandou General Hospital Manado.

Methods: An cross-sectional study involving 20 medical personnel that have worked for more than 6 months in negative -pressure isolation ward and natural ventilation isolation ward at Kandou General Hospital Manado, North Celebes, Indonesia. Exclusion criteria were history of TB disease or TB latent, immunodeficiency and long term steroid uses. Fischer exact test and regression analysis was used to evaluate the differences between variables. **Results:** There were 7 medical personnel (35%) from the negative-pressure isolation ward compared to 11 medical personnel (55%) in natural ventilation isolation ward that were positive for Interferon Gamma Release Assay (IGRA). There were no significance differences between the type of isolation room and the prevalence of latent tuberculosis ($p = 0.341$). There were also no significant correlations between room type ($p = 0.633$), work duration ($p = 0.181$), and the prevalence of latent TB ($R^2 = 0.06$). **Conclusion :** There is no significant difference between latent TB prevalence among medical presonnel in negative- pressure isolation room and natural ventilation isolation room. Natural ventilation room could be used as an alternative to negative-pressure isolation room.

Keywords: Latent tuberculosis; health care workers; negative pressure room

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Shelf life of sterilized packed items stored in CSSD of a Vietnam University Medical Center

Nguyen Vu Hoang Yen¹, Vu Thi Cham¹, Trinh Thi Thoa¹, Pham Thi Thuy¹, Duong Thi Tam¹, Hoang Kim Ngan¹, Lu Thi Mong Huong¹, Thai Hong Van¹, Nguyen Thi Mong Huyen¹, Tran Hoang Thanh¹, Nguyen Duc Duy¹, Nguyen Do Phuong Thao², Le Vo Hong Tuyet² and Huynh Minh Tuan^{1,2}

¹University Medical Center, Ho Chi Minh City, Viet Nam and ²University of Medicine and Pharmacy at Ho Chi Minh City

Corresponding author: Huynh Minh Tuan, MD., PhD. ((+84) 909.349.918; huynh.tuan@umc.edu.vn)

Background: In University Medical Center Ho Chi Minh City (UMC), shelf life of sterilized packed items has been followed by time-related principle. However, duration of sterility has not been based on strong scientific evidence. **Objectives:** To determine the most appropriate shelf life for sterilized products according to packaging material and sterilization methods. **Methods:** All the experimental and the control samples (surgical instruments and linen) were prepared by four types of packaging materials (peel pouch, nonwoven, linen, and rigid container) and three types of sterilization methods (steam, Hydrogen Peroxide, Ethylene Oxide). After sterilization, sterilized samples were stored at CSSD's storage and tested for microbial contamination in 07 periods: after 07 days, 14 days, 01 month, 03 months, 06 months, 12 months, and 18 months. Identification of the storage environment (shelf location, temperature, and relative humidity) were recorded as the same time collected samples. **Results:** Positive microbial cultures were seen in 0.44% (07 samples) of 1,574 samples. Up to 18 months, no organisms was cultured from any sample of (1) autoclaved surgical instrument packages wrapped in peel pouches, nonwoven, linen, (2) Hydrogen Peroxide sterilized surgical instrument packages wrapped in nonwoven, (3) Ethylene Oxide sterilized surgical instrument packages, and (4) autoclaved linen packages wrapped in nonwoven. Organisms detected were both Gram-Positive and Gram-Negative bacteria. Just only approximately 17% control samples grew bacteria. There was no any statistically significant relationship between positive experimental samples and packaging materials, sterilization methods, or storage conditions. **Conclusions:** Based on results of this experiment, shelf life of sterilized packed items should be still followed by time-related principle in UMC. However, the currently shelf life can be extended to reduce unnecessary costs and increase the usage rotation.

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